

AMPTIAC Publishes Special Newsletter Highlighting Efforts of the Army Research Laboratory

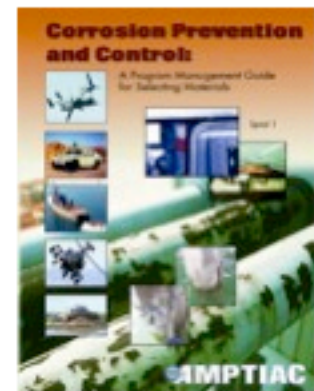
The Army is faced with transforming traditional battlefield tactics into a lightweight, highly mobile, and more lethal force to enable our ground troops to become more effective in the war against terror and other emerging global threats. This special issue of the *AMPTIAC Quarterly* contains 132 pages of research topics encompassing survivability, lethality, and multifunctional/special function materials. The challenge for our community is to develop the advanced materials that will provide the Army with improved effectiveness across the full spectrum of operational environments. A greater consideration for "green" solutions that reduce the generation or introduction of toxic materials into the environment is also addressed.



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AMPTIAC Supports Department of Defense Initiative to Reduce Cost of Corrosion

In June 2005, AMPTIAC released the first edition of "Corrosion Prevention and Control: A Program Management Guide for Selecting Materials." This extensive handbook covers the topics of environmental corrosivity, forms of corrosion, field experiences in the Department of Defense, corrosion properties of metals, and corrosion prevention and control methods, plus takes a look at various corrosion monitoring and inspection techniques. An addition to the handbook is in the works which will provide a materials selection process that incorporates the effects of corrosion.



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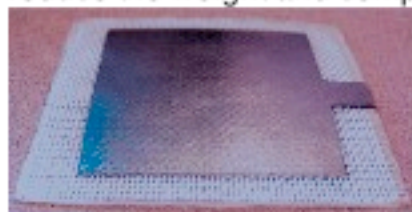
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Twenty articles contained in Volume 8, Number 4 of the *AMPTIAC Quarterly* provide a glimpse of some of the technologies that will enable the Army to transform into a more mobile, survivable, and lethal force while simultaneously becoming a better steward of the environment. Much recent work has been undertaken to improve the survivability of vehicles and their occupants subjected to fire from ballistic weapons and/or blast and fragmentation from mines, rocket-propelled grenades (RPGs), and improvised explosive

devices (IEDs). Discussed in this publication are several of the emerging materials that will enable improved yet lighter armor for future systems. Becoming more effective against insurgents requires lighter armored vehicles employing innovative materials, including transparent armor for windshields. Other subjects of significant interest are those related to ordnance materials – including propellants, projectiles, and gun barrels. One area of concern has been to find replacements for lead bullets and depleted uranium (DU) kinetic energy penetrators.



Environmental concerns are the primary reasons for finding alternative materials for these applications, and several of the articles discuss the programs addressing this problem. One approach to reduce the weight and complexity of systems is to develop multifunctional materials that perform two or more primary functions. Army researchers have many programs underway that are leading to technologies which exploit this concept, and several of them are mentioned here. A multitude of other technology-development efforts are also being examined to develop the new generation of lighter, higher-performance materials needed to improve warfighting effectiveness.



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AMPTIAC Supports Department of Defense Initiative to Reduce Cost of Corrosion (continued)



Corrosion costs have been steadily rising, with latest assessments concluding that it costs the Department of Defense \$10 to \$20 billion per year. In response, a new corrosion policy mandated by Congress has been implemented. AMPTIAC's handbook was produced in direct support of this policy to help bring down the extensive cost of corrosion, filling the need for improved education and awareness within the Defense community. Chapter One of the handbook provides a discussion of the importance of incorporating materials selection for corrosion control in the design phase of new systems. Chapter Two is bookmarked for a future materials selection process incorporating improved consideration of corrosion prevention and control during design, and will be completed in the spring of 2006. Chapter Three provides an assessment of the various environments encountered by military systems, followed by a detailed assessment of the eight major forms of corrosion as well as numerous minor forms. Department of Defense field experiences are reported in Chapter Five, with breakdowns of the major components/corrosion problems in various military systems. The next chapter presents the metal classes and their corrosion resistance and susceptibilities, followed by a discussion of methods for corrosion prevention and control and a chapter on corrosion monitoring and inspection.



This new handbook provides a comprehensive guide for program managers and design engineers to use in selecting materials that will reduce life-cycle costs.

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